

**GALT**

**water pollution  
control plant**

**1968**

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Division of Plant Operations

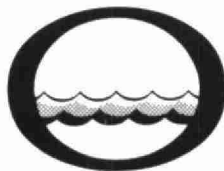
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*Water management in Ontario*

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Water Resources  
Commission

135 St. Clair Ave. W.  
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Ontario


We are pleased to present you with the Operating Summary for the water pollution control facilities operated for you during 1968.

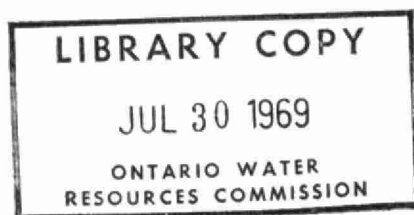
Both the financial and technical information presented should be of assistance to your present and future planning in this important phase of municipal activity.

A new format has been devised to allow greater readability with equally detailed content. We trust that this will meet with your approval.

Our staff wish to express their appreciation for your co-operation throughout the year.

  
D. S. Caverly,  
General Manager.

  
D. A. McTavish, P. Eng.,  
Director,  
Division of Plant Operations.



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**GALT**  
**water pollution control plant**

operated for

**THE CITY OF GALT**

by the

**ONTARIO WATER RESOURCES COMMISSION**

**1968 ANNUAL OPERATING SUMMARY**

## FOREWORD

● This operating summary outlines the project's technical capabilities and financial status in 1968. Such information mirrors past and present performance, but a major intention is to anticipate the future -- to solve problems before they occur.

The new format in which this year's data are presented is designed to offer a higher level of readability than in the past, without a corresponding decrease in compactness, accuracy and detail.

Although your Regional Operations Engineer carries the major responsibility for the contents of the report, those involved in its preparation are attached to several Commission sections and divisions. The statistics section of the Division of Plant Operations compiled the information for the graphs and charts. The draughting section of the Division of Sanitary Engineering drew the graphs. The Division of Finance provided all cost data.

Only the close co-operation of these departments allowed the publication of this summary.

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## **'68 REVIEW**

The operating costs for the year were \$87,458.45, a decrease of \$11,737.20 from 1967. The cost of treatment decreased from \$47.70 per million gallons in 1967 to \$40.73 per million gallons in 1968.

In 1968 the plant treated an average flow of 5.87 mgd which is 117.2% of the design capacity of 5.00 mgd. This design flow was exceeded 95% of the time during the year.

Reductions of 89% in BOD and 89% in suspended solids were experienced in 1968 as compared to reductions of 88.1% in BOD and 88.3% in suspended solids in 1967.

The average raw sewage strength was 132 mg/l for BOD and 183 mg/l for suspended solids. Raw sewage strength in 1967 was 138 mg/l for BOD and 198 mg/l for suspended solids.

The final effluent average BOD and suspended solids concentrations were 14 mg/l and 20 mg/l respectively.

A Provincially-financed scheme is underway to increase the capacity of the plant.



## PROJECT COSTS

NET CAPITAL COST (Final)	\$1,211,259.48
DEDUCT - Portion Financed by CMHC-MDLB (Final)	<u>804,340.16</u>
Long Term Debt to OWRC	\$ <u>406,919.32</u>
Debt Retirement Balance at Credit (Sinking Fund) December 31, 1968	\$ <u>94,727.45</u>
Net Operating	\$ 87,458.45
Debt Retirement	14,763.00
Reserve	7,483.21
Interest Charged	<u>22,845.86</u>
TOTAL	\$ <u>132,550.52</u>

### RESERVE ACCOUNT

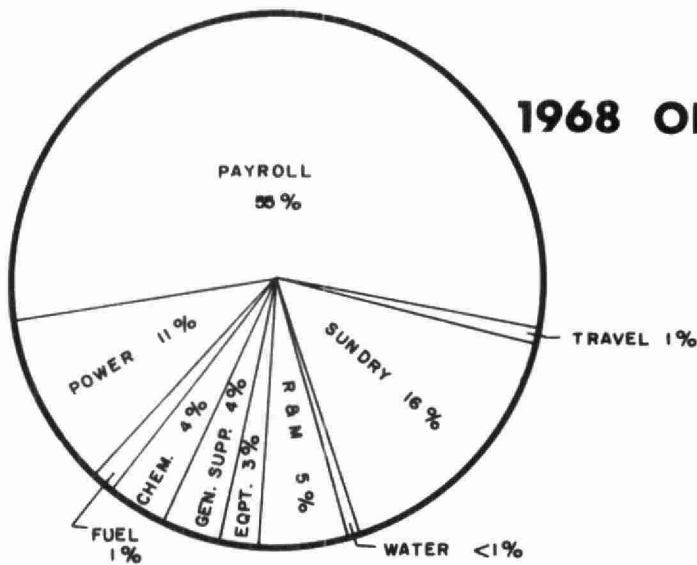
Balance at January 1, 1968	\$ 29,514.48
Deposited by Municipality	7,483.21
Interest Earned	1,750.51
	<u>38,748.20</u>
Less Expenditures	<u>3,600.80</u>
Balance at December 31, 1968	\$ <u>35,147.40</u>

## Monthly Operating Costs

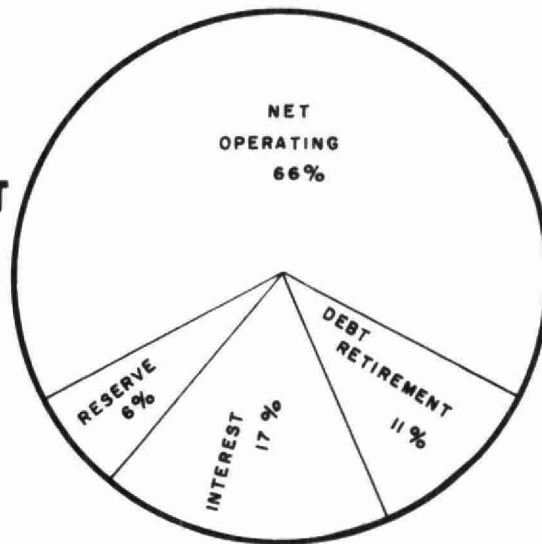
MONTH	TOTAL EXPENDITURE	PAYROLL	CASUAL PAYROLL	FUEL	POWER	CHEMICAL	GENERAL SUPPLIES	EQUIPMENT	REPAIRS & MAINTENANCE	* SUNDRY	WATER	TRAVEL
JAN	5032.29	3303.08	90.42	-	-	1440.04	111.11	-	44.85	20.53	-	22.26
FEB	8648.01	3203.64	-	310.34	998.52	-	481.99	99.75	797.15	2623.32	133.30	-
MAR	8380.57	5154.33	-	277.77	855.36	-	215.44	120.33	199.68	1521.24	12.76	23.66
APRIL	4723.26	3233.96	-	141.00	716.56	-	304.08	-	271.88	25.08	4.80	25.90
MAY	6051.88	3221.87	395.60	117.88	747.52	-	431.29	23.93	210.78	874.97	5.36	22.68
JUNE	6126.20	3221.87	369.40	172.58	755.54	-	222.21	248.44	42.40	1055.12	6.58	32.06
JULY	6535.59	3171.70	505.59	-	774.61	-	165.55	241.50	501.92	1071.51	31.25	71.90
AUG	8351.43	5017.78	629.54	-	711.69	-	201.32	201.66	178.60	1249.30	56.44	105.10
SEPT	5231.01	2992.77	717.96	-	838.87	-	138.61	23.75	413.00	6.37	99.68	-
OCT	7841.10	3305.40	308.42	-	672.71	-	231.83	318.17	693.18	2232.58	44.77	34.04
NOV	8217.31	3244.11	-	-	826.83	1699.50	186.89	924.05	137.99	1110.81	14.56	72.57
DEC	12319.80	6724.70	-	225.22	1504.40	-	437.63	76.66	1162.80	2038.79	13.48	136.12
TOTAL	87458.45	45795.21	3016.93	1244.79	9402.61	3139.54	3127.95	2278.24	4654.23	13829.62	422.98	546.35

\*SUNDRY INCLUDES SLUDGE HAULING COSTS WHICH WERE \$12,189.00

## 1968 OPERATING COSTS



## TOTAL ANNUAL COST



## Yearly Operating Costs

YEAR	M.G.TREATED	TOTAL COST	COST PER MILLION GALLONS	COST PER LB OF BOD REMOVED
1961	1895.2	\$77,875.88	\$41.09	3 cents
1965	1853.9	73,672.19	39.74	4 cents
1966	1903.9	83,578.97	43.90	3 cents
1967	2079.5	99,195.65	47.70	4 cents
1968	2147.4	87,458.45	40.73	3 cents

## **Process Data**

The average daily flow increased from 5.70 mgd in 1967 to 5.87 mgd in 1968. Daily flows as low as 3.60 mgd and as high as 10.29 mgd were experienced throughout the year.

The final effluent BOD and suspended solids quality is illustrated in the operating result curves. Forty-seven percent of the final effluent samples taken during the year exceeded OWRC objectives with respect to BOD concentration and 83% exceeded these objectives with respect to suspended solids concentration. The OWRC objective for both BOD and suspended solids in the final effluent is 15 mg/l.

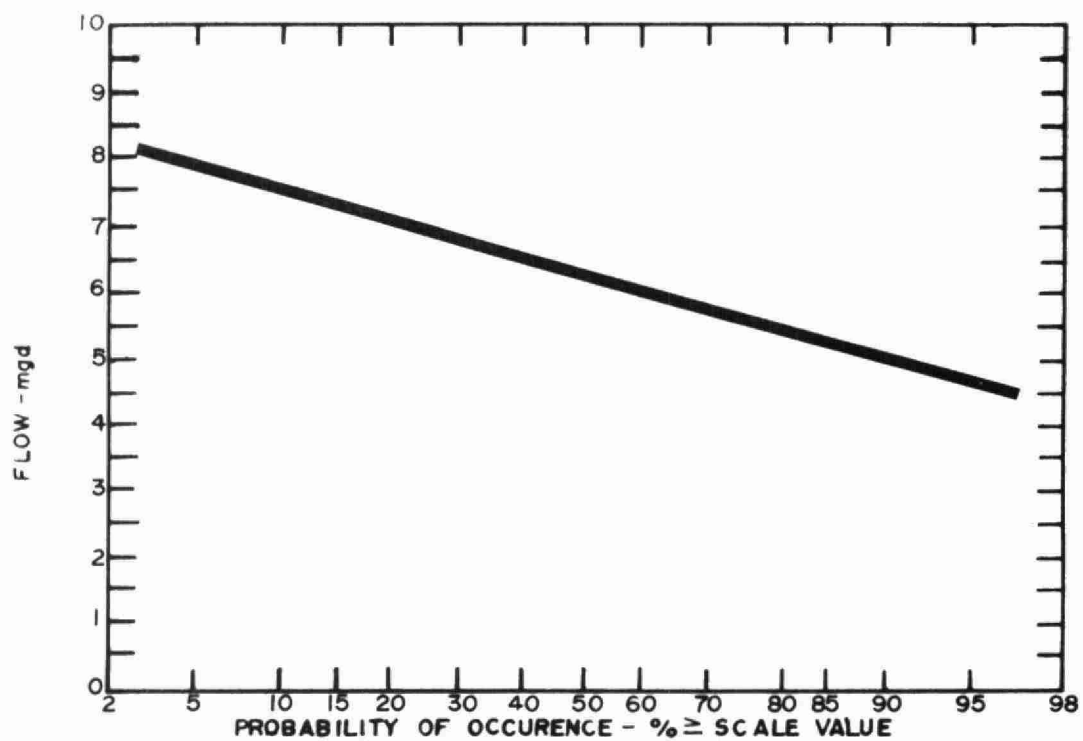
## PLANT FLOWS and CHLORINATION

MONTH	TOTAL FLOW mg	AVERAGE DAILY FLOW mg	MAXIMUM DAILY FLOW mg	MINIMUM DAILY FLOW mg	CHLORINE USED 10 <sup>3</sup> lbs.	DOSAGE mg/l
JAN	174.2	5.62	7.69	4.35	3.91	2.2
FEB	200.2	6.90	10.29	5.26	3.55	2.4
MAR	214.6	6.92	8.24	5.22	0	-
APR	189.5	6.32	7.22	4.96	0	-
MAY	181.9	5.87	6.79	4.68	0	-
JUN	176.1	5.87	9.00	3.60	2.77	2.1
JUL	156.4	5.04	6.47	3.60	5.01	3.2
AUG	178.6	5.76	9.28	4.18	4.78	2.7
SEPT	178.3	5.79	7.37	4.71	5.99	3.4
OCT	170.6	5.50	6.81	3.88	6.60	4.1
NOV	149.6	4.99	5.85	2.70	5.10	3.4
DEC	181.9	5.87	-	-	4.57	2.5
TOTAL	2147.4	-	-	-	41.28	-
AVERAGE	-	5.87	-	-	4.59 *	2.6 *

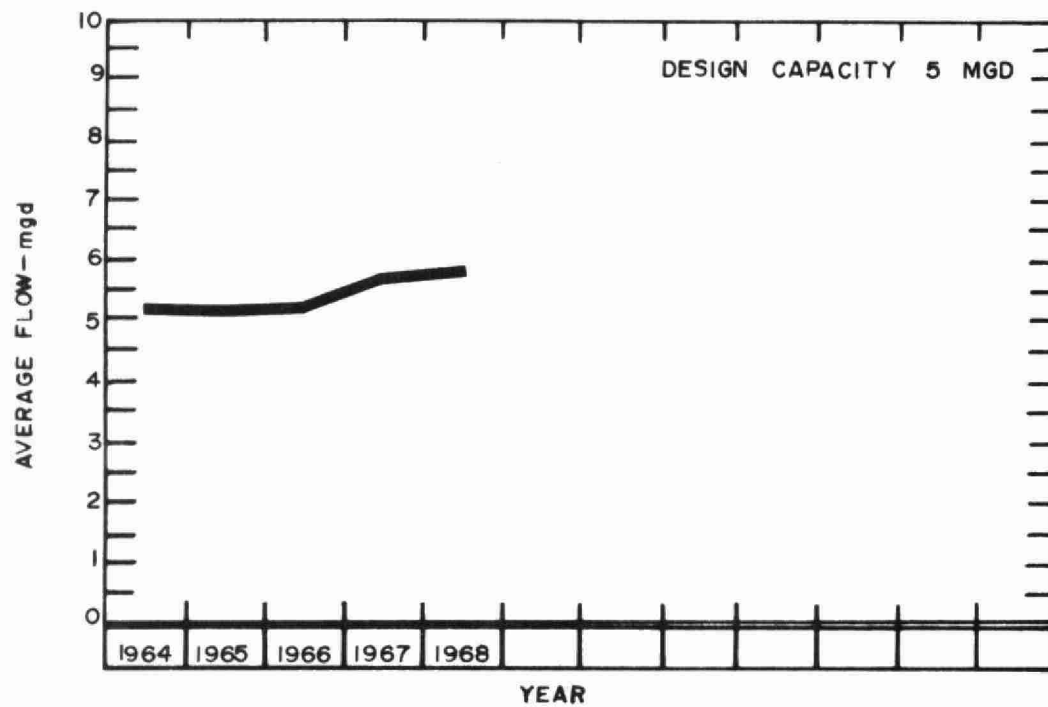
\* Nine months

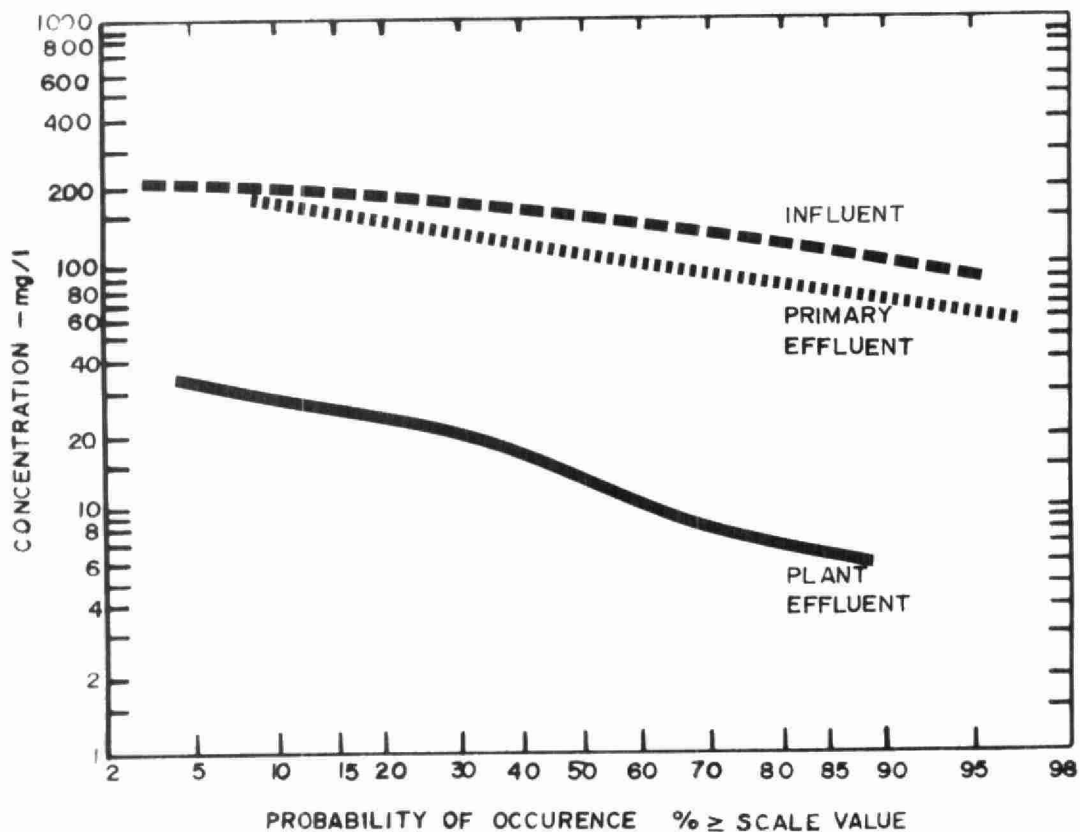
### COMMENTS

Chlorination was carried out for only 8.5 months of the year due to difficulty in obtaining replacement parts for the chlorinator. During the remaining months, a total of 41,280 lbs. of chlorine was used to maintain a 0.50 mg/l chlorine residual in the final effluent. An average dosage rate of 2.60 mg/l was required to maintain this residual in the final effluent.

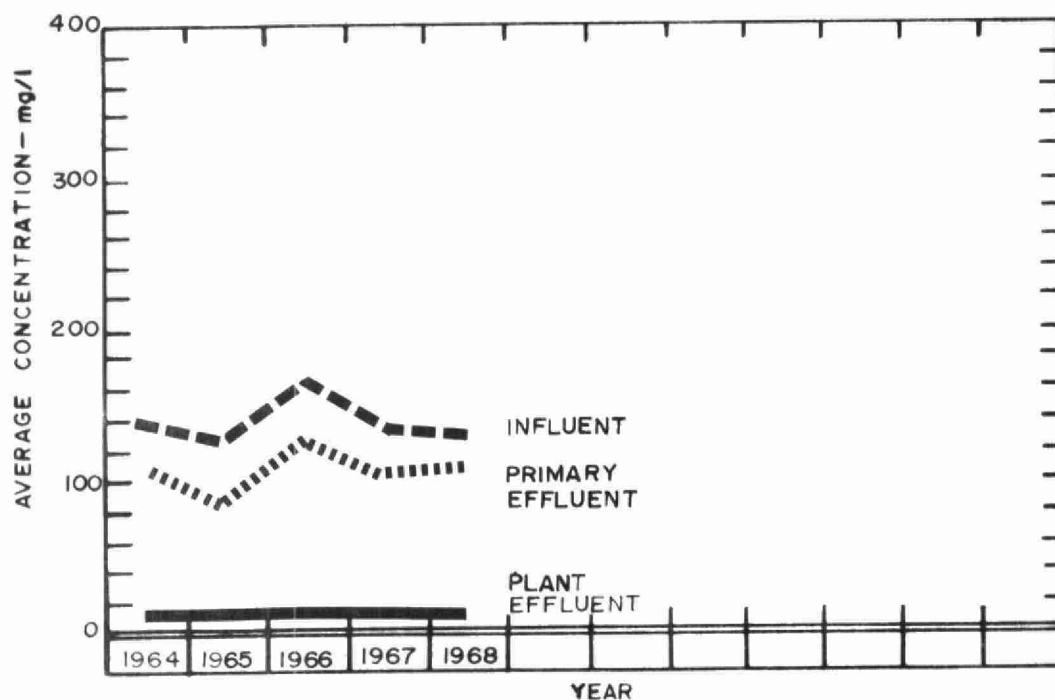


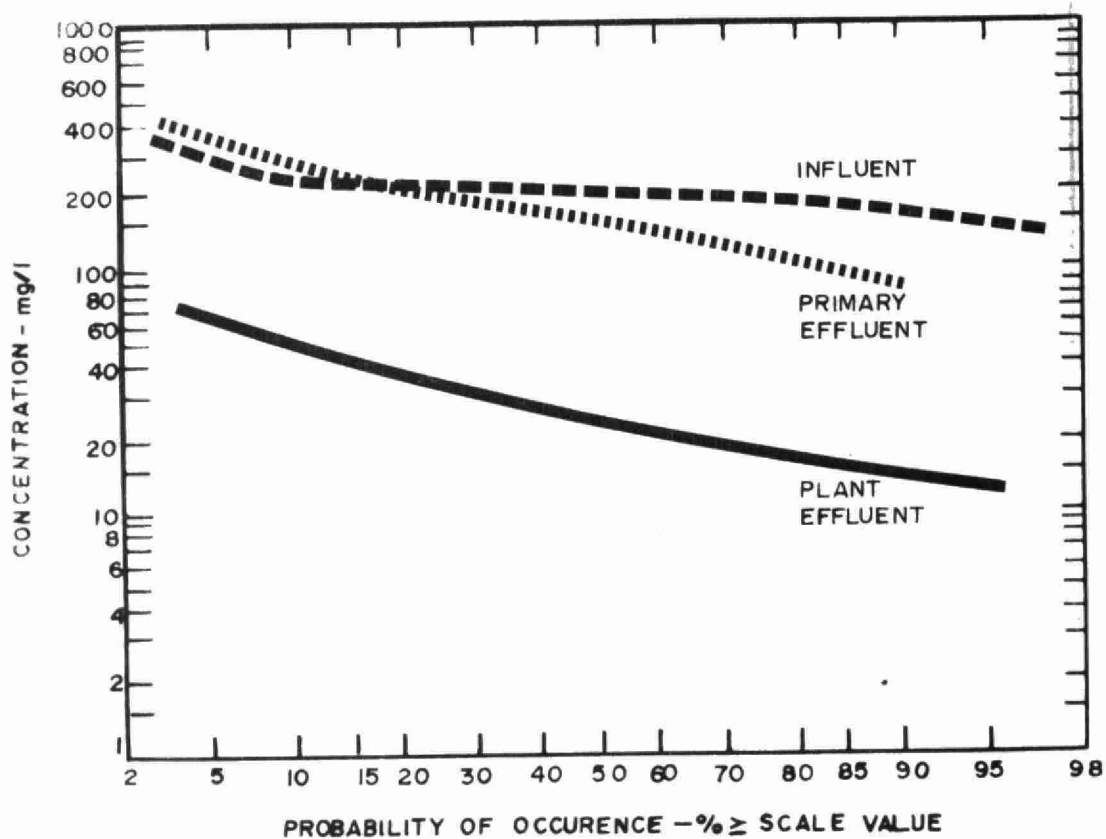
## FL O W S



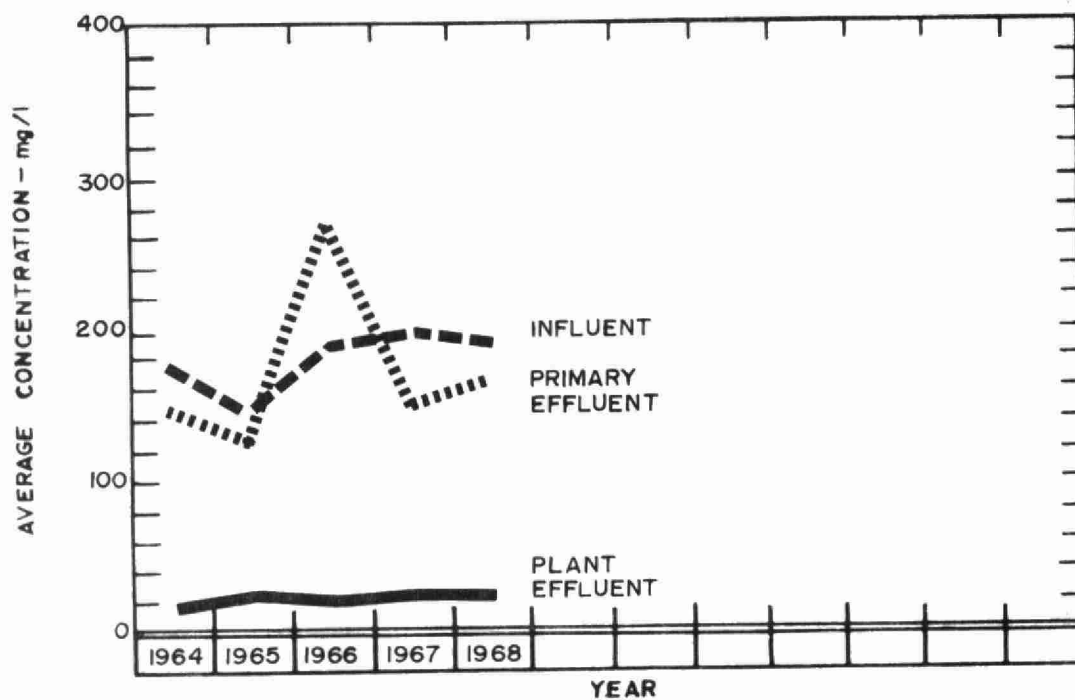


## BIOCHEMICAL OXYGEN DEMAND





## SUSPENDED SOLIDS





## PLANT EFFICIENCY

MONTH	BIOCHEMICAL OXYGEN DEMAND				SUSPENDED SOLIDS				GRIT
	INF CONC <sup>N</sup> mg/l	EFF CONC <sup>N</sup> mg/l	RED <sup>N</sup> %	REMOVAL 10 <sup>5</sup> lb	INF CONC <sup>N</sup> mg/l	EFF CONC <sup>N</sup> mg/l	RED <sup>N</sup> %	REMOVAL 10 <sup>5</sup> lb	REMOVAL ft <sup>3</sup>
JAN	82	4	96	1.37	150	5	97	2.53	-
FEB	109	20	82	1.78	159	31	81	2.56	62
MAR	166	27	84	2.98	155	30	81	2.60	20
APR	145	15	90	2.46	166	26	84	2.65	19
MAY	137	7	94	2.36	198	19	90	3.26	-
JUN	102	7	93	1.67	142	11	92	2.31	24
JULY	152	5	97	2.30	175	11	94	2.57	20
AUG	170	-	-	-	308	-	-	-	74
SEPT	105	16	85	1.55	146	17	88	2.24	57
OCT	130	11	91	2.03	199	21	89	3.04	10
NOV	170	13	92	2.35	237	14	94	3.33	17
DEC	113	25	78	1.60	170	39	77	2.38	28
TOTAL	-	-	-	-	-	-	-	-	-
AVERAGE	132	14	89	2.05	183	20	89	2.68	33

### COMMENTS

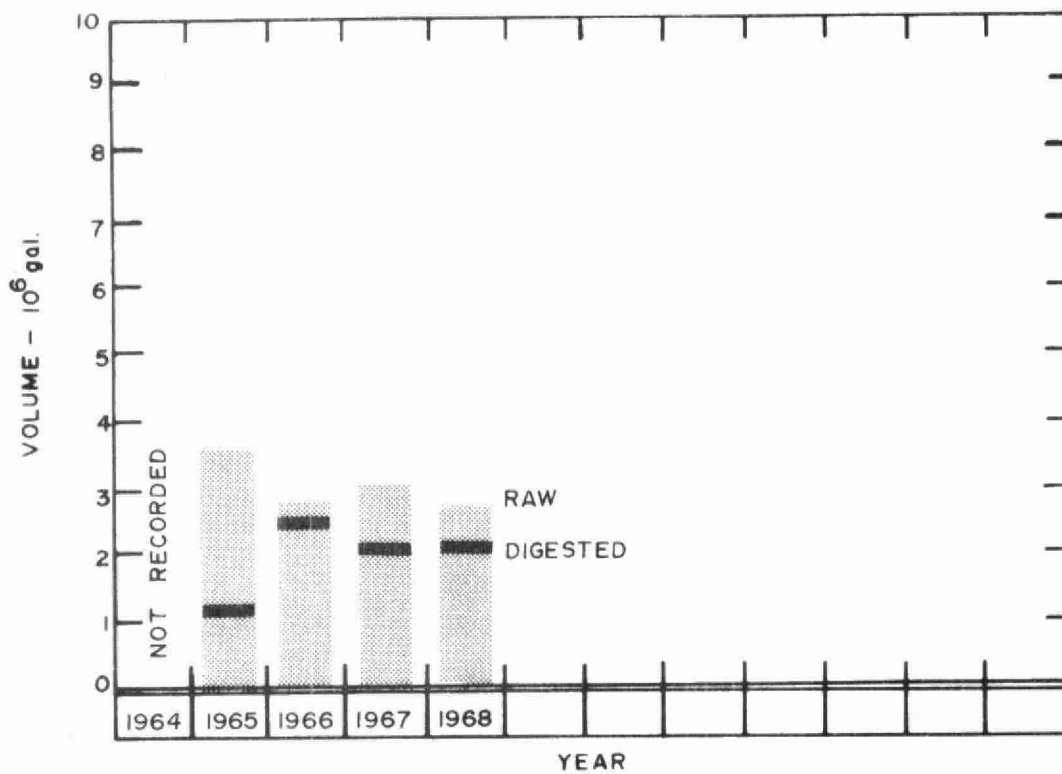
The treatment system is designed to treat a raw sewage with a BOD and suspended solids concentration of 250 mg/l. The average raw sewage BOD concentration was 132 mg/l, 53% of the design value. The average suspended solids concentration of 183 mg/l was 73% of the design value.

# AERATION

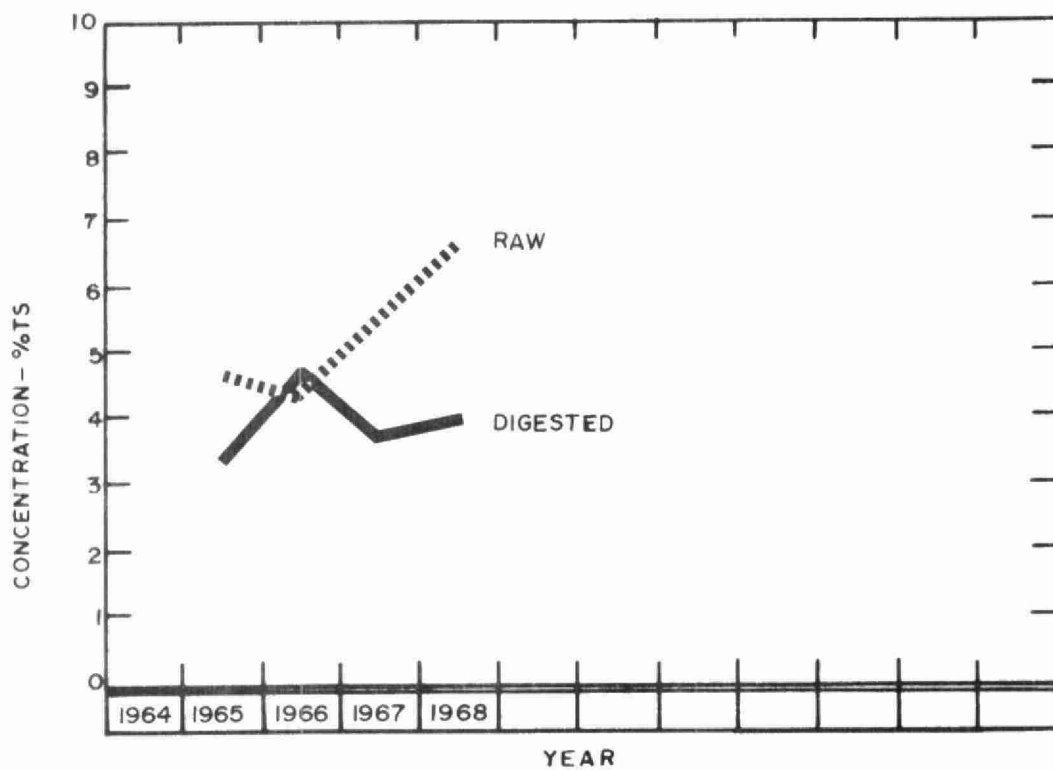
MONTH	AVERAGE FLOW mgd	PRIMARY EFF		SECONDARY EFF		MLSS CONC <sup>N</sup> mg/l	F/M $\left(\frac{\text{lb BOD}}{\text{lb MLSS}}\right)$	AIR USED $\left(\frac{1000 \text{ ft}^3}{\text{lb BOD}}\right)$ REMOVED	WASTE SLUDGE 10 <sup>5</sup> lb
		BOD CONC <sup>N</sup> mg/l	SS CONC <sup>N</sup> mg/l	BOD CONC <sup>N</sup> mg/l	SS CONC <sup>N</sup> mg/l				
JAN	5.62	185	302	4	5	2,960	.24	-	2.30
FEB	6.90	75	105	20	31	2,920	.18	-	.50
MAR	6.92	112	97	27	30	3,800	.14	-	1.00
APRIL	6.32	115	175	15	26	4,170	.12	-	1.04
MAY	5.87	111	152	7	19	3,840	.11	-	1.04
JUN	5.87	100	135	7	11	3,580	.11	-	.28
JUL	5.04	143	253	5	11	3,310	.15	-	.42
AUG	5.76	-	-	-	-	2,330	-	-	.92
SEPT	5.79	58	161	16	17	3,110	.07	-	.22
OCT	5.50	72	98	11	24	2,980	.09	-	.37
NOV	4.99	135	136	13	14	2,310	.19	-	.84
DEC	5.87	101	142	25	39	2,390	.17	-	-
TOTAL	-	-	-	-	-	-	-	-	8.93
AVERAGE	5.87	110	160	14	21	3,140	.14	-	.81

## COMMENTS

An average loading of 0.14 lbs. of BOD per pound of MLSS was experienced in the aeration section. The mechanical aerators had no difficulty in maintaining an adequate dissolved oxygen supply at this low loading rate.



## DIGESTION



## SLUDGE DIGESTION and DISPOSAL

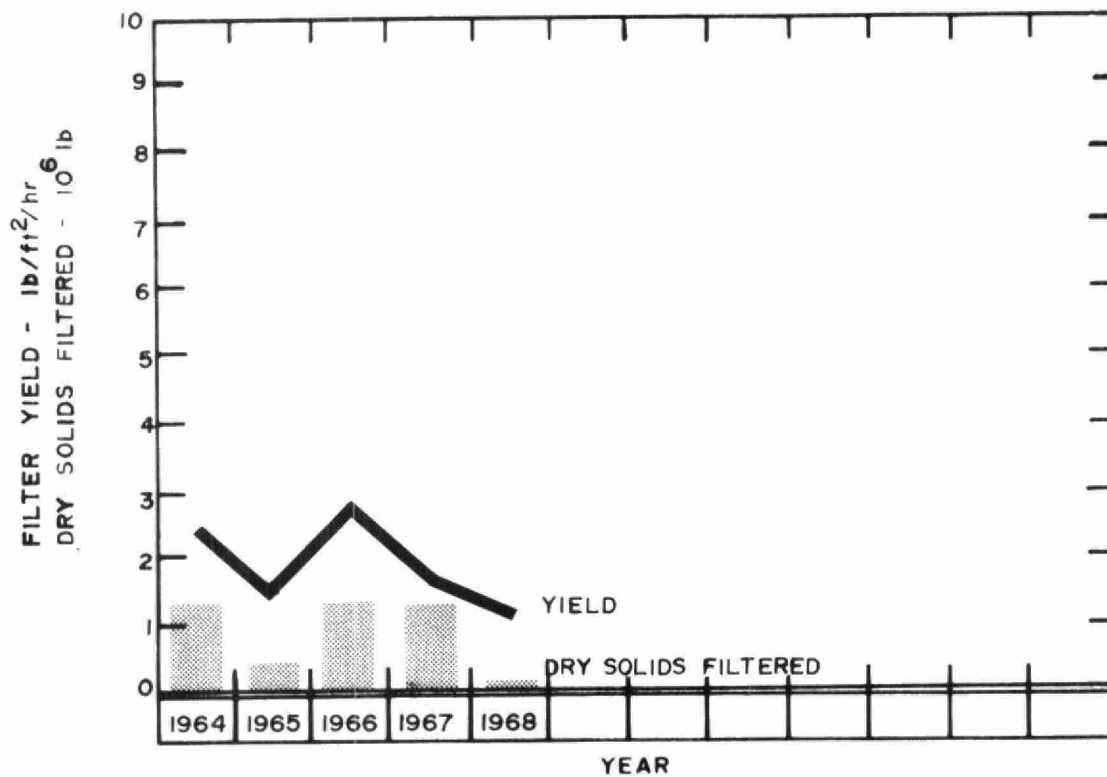
MONTH	RAW SLUDGE			DIGESTED SLUDGE			SUPERNATANT		SLUDGE DISPOSAL	
	VOLUME 10 <sup>5</sup> gal	T. S. %	V. S. %	VOLUME 10 <sup>5</sup> gal	T. S. %	V. S. %	VOLUME 10 <sup>5</sup> gal	T. S. %	LIQUID yd <sup>3</sup>	DEWATERED yd <sup>3</sup>
JAN	4.35	6.4	-	4.48	3.7	-	0	-	2324	94
FEB	2.84	7.2	68	2.16	3.9		.84	-	1282	0
MAR	1.91	5.2	42	.06	4.0	54	.65	3.2	38	0
APR	1.43	7.8	66	1.18	3.8	51	.17	-	698	0
MAY	1.95	7.7	65	1.75	4.0	55	0	-	1050	0
JUN	2.63	6.7	68	1.50	4.3	55	.40	1.4	900	0
JUL	2.37	6.2	52	1.92	3.9	50	.69	.1	1148	0
AUG	2.18	6.3	-	1.84	4.0	-	.87	1.7	1103	0
SEPT	1.76	6.8	-	1.56	4.0	-	.14	.1	975	0
OCT	1.86	7.0	72	1.59	4.3	55	.42	.2	945	0
NOV	1.95	6.5	76	1.63	4.5	61	.14	.2	975	0
DEC	2.34	6.3	65	1.75	4.1	58	.52	.2	1050	0
TOTAL	27.57	-	-	21.42	-	-	4.84	-	12488	94
AVERAGE	2.30	6.7	64	1.79	4.0	55	.40	.9	1041	-

### COMMENTS

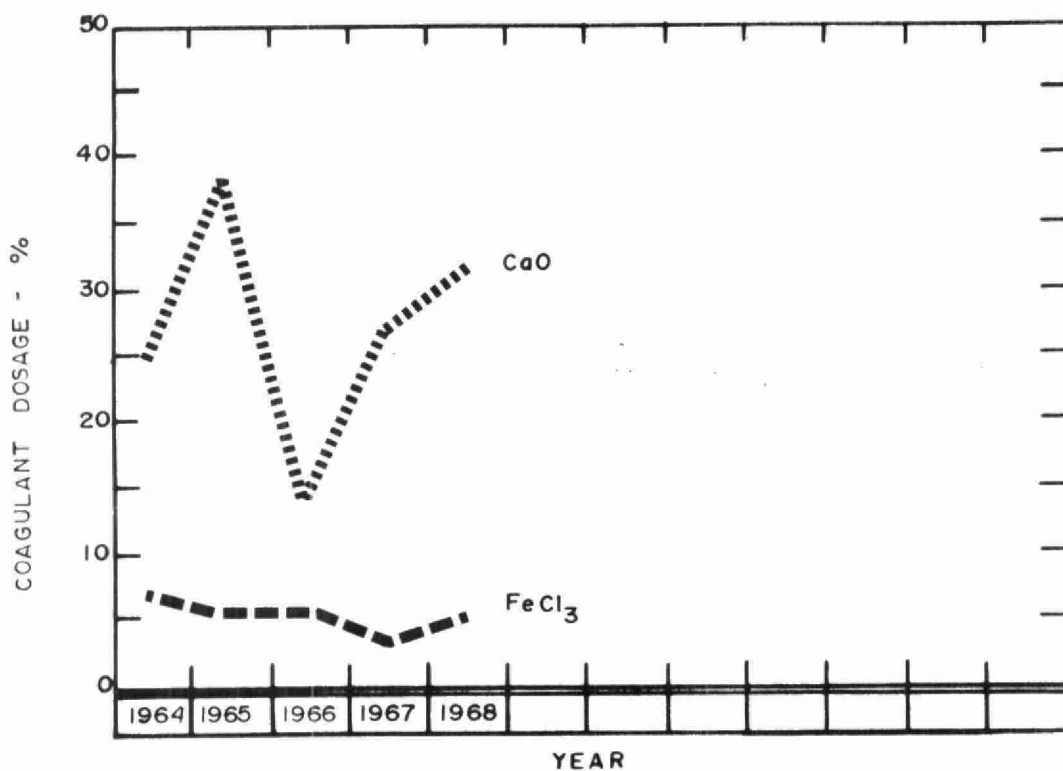
From the data supplied the reduction in volatile solids was determined to be approximately 31%. Excellent digestion will provide a volatile solids reduction of approximately 47% for the same volatile solids concentration in the raw sludge.

The total volume of raw sludge was reduced by 22% through the digestion process.

The vacuum filter operation was terminated in January. Current haulage, labour and chemical costs made it more economical to haul liquid digested sludge than to dewater and haul filtered sludge during the year.



## VACUUM FILTRATION



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## CONCLUSIONS

The plant produced a good effluent during the year. The average BOD and suspended solids concentrations were 14 mg/l and 20 mg/l respectively. This efficiency was maintained despite the fact that the plant was hydraulically overloaded 95% of the time.

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